

Features

- RoHS Compliant
- $R_{DS(ON),typ.}=5.4\ \Omega@V_{GS}=10V$
- Low Gate Charge Minimize Switching Loss
- Fast Recovery Body Diode

Description

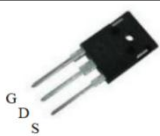
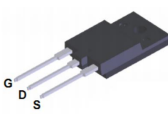
BV_{DSS}	$R_{DS(ON),Typ.}$	ID
1500V	5.4Ω	3A

Applications

- Adaptor
- Charger
- SMPS Standby Power



ORDERING INFORMATION

Outline	Part Number	Package	Marking	Packing	Quantity
	ITH03N150	TO-247	ITH03N150 /XXX	Tube	30
	ITP03N150	TO-3PF	ITP03N150 /XXX		

CONTENTS

Absolute Maximum Ratings.....	.3
Thermal Characteristics.....	.3
Electrical Optical Characteristics.....	.4
Characteristic Curves.....	.5
Test Circuits.....	.8
Package Dimensions.....	.10
Ordering And Marking Information.....	.12
Disclaimer.....	.13

ABSOLUTE MAXIMUM RATINGS (T_a=25°C)

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-to-Source Voltage	1500	V
V _{GSS}	Gate-to-Source Voltage	±30	
I _D	Continuous Drain Current	3	A
I _{DM}	Pulsed Drain Current at V _{GS} =10V	12	
E _{AS}	Single Pulse Avalanche Energy,L=30mH	500	mJ
P _D	Power Dissipation	186	W
	Derating Factor above 25°C	1.49	W/°C
T _L	Soldering Temperature Distance of 1.6mm from case for 10 seconds	300	°C
TJ& TSTG	Operating and Storage Temperature Range	-55 to 150	

Caution: Stresses greater than those listed in the “Absolute Maximum Ratings” may cause permanent damage to the device.

THERMAL CHARACTERISTICS

Symbol	Parameter	Value	Unit
R _{θJC}	Thermal Resistance, Junction-to-Case	0.67	°C/W
R _{θJA}	Thermal Resistance, Junction-to-Ambient	55	

ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions
OFF Characteristics						
BV_{DSS}	Drain-to-Source Breakdown Voltage	1500	--	--	V	$V_{GS}=0V, I_D=250\mu A$
I_{DSS}	Drain-to-Source Leakage Current	--	--	1	uA	$V_{DS}=1500V, V_{GS}=0V$
		--	--	500		$V_{DS}=1200V, V_{GS}=0V, T_J=125^\circ C$
I_{GSS}	Gate-to-Source Leakage Current	--	--	+100	nA	$V_{GS}=+30V, V_{DS}=0V$
		--	--	-100		$V_{GS}=-30V, V_{DS}=0V$
ON Characteristics						
$R_{DS(ON)}$	Static Drain-to-Source On-Resistance	--	5.4	8.2	Ω	$V_{GS}=10V, I_D=2.0A$
$V_{GS(TH)}$	Gate Threshold Voltage	2.5	--	4.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
g_{fs}	Forward Transconductance	--	3.0	--	S	$V_{DS}=15V, I_D=3A$
Dynamic Characteristics(Essentially independent of operating temperature)						
C_{iss}	Input Capacitance	--	1600	--	pF	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$
C_{riss}	Reverse Transfer Capacitance	--	33	--		
C_{oss}	Output Capacitance	--	100	--		
R_g	Gate input resistance	--	4.5	--	Ω	$f=1\text{ MHz Gate DC Bias}=0$ Test signal
Q_g	Total Gate Charge	--	36	--	nC	$V_{DD}=750V, I_D=3A, V_{GS}=0\text{ to }10V$
Q_{gs}	Gate-to-Source Charge	--	9.5	--		
Q_{gd}	Gate-to-Drain (Miller) Charge	--	12	--		
Resistive Switching Characteristics(Essentially independent of operating temperature)						
$t_{d(ON)}$	Turn-on Delay Time	--	25	--	ns	$V_{DD}=750V, I_D=3A, V_{GS}=10V, R_g=4.7\Omega$
t_{rise}	Rise Time	--	48	--		
$t_{d(OFF)}$	Turn-Off Delay Time	--	57	--		
t_{fall}	Fall Time	--	52	--		
Source-Drain Body Diode Characteristics						
I_{SD}	Continuous Source Current[2]	--	--	3	A	Integral pn-diode in MOSFET
I_{SM}	Pulsed Source Current[2]	--	--	12		
V_{SD}	Diode Forward Voltage	--	--	1.5	V	$I_S=3A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	--	255	--	ns	$V_{GS}=0V$
Q_{rr}	Reverse Recovery Charge	--	1.1	--	uC	$I_F=3A, di/dt=100A/\mu s$

[1] $T_J=+25^\circ C$ to $+150^\circ C$ [2] Pulse width $\leq 380\mu s$; duty cycles $\leq 2\%$.

CHARACTERISTIC CURVES

Figure 1. Maximum Transient Thermal Impedance

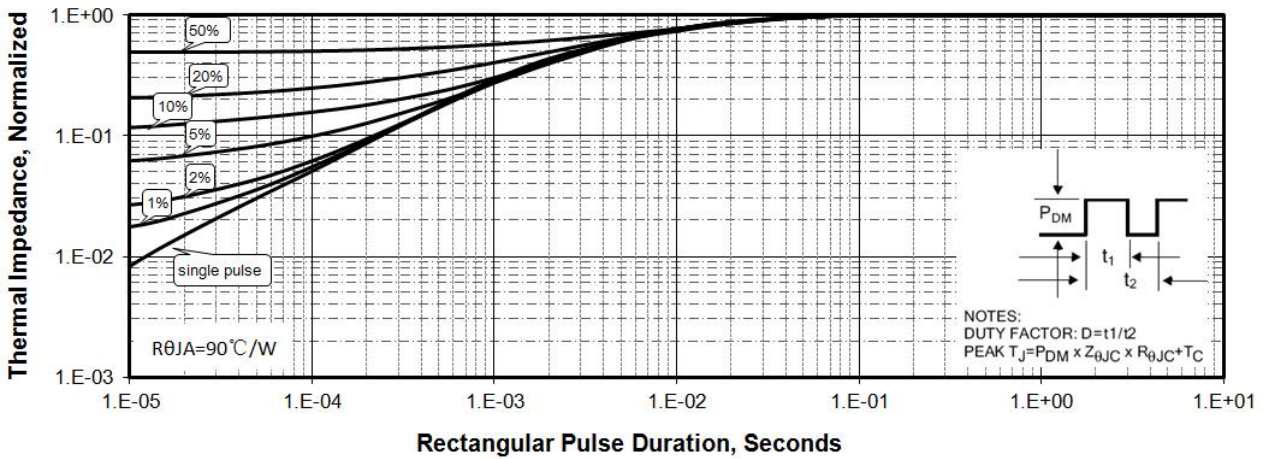


Figure 2 . Max. Power Dissipation vs Case Temperature

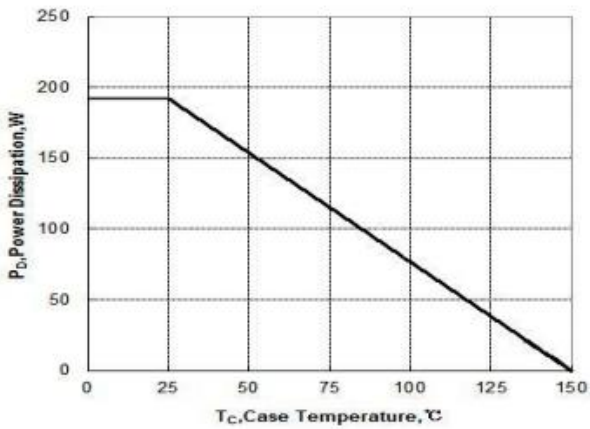


Figure 3 .Maximum Continuous Drain Current vs Tc

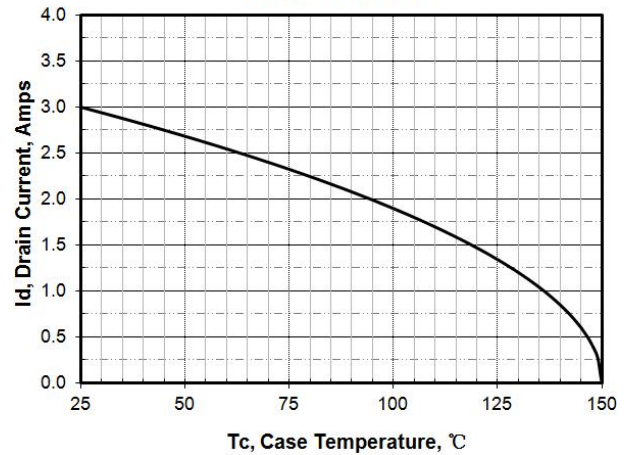


Figure 4. Output Characteristics

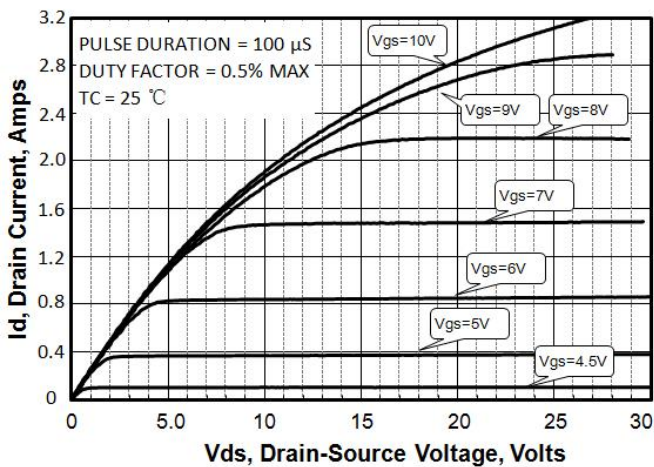
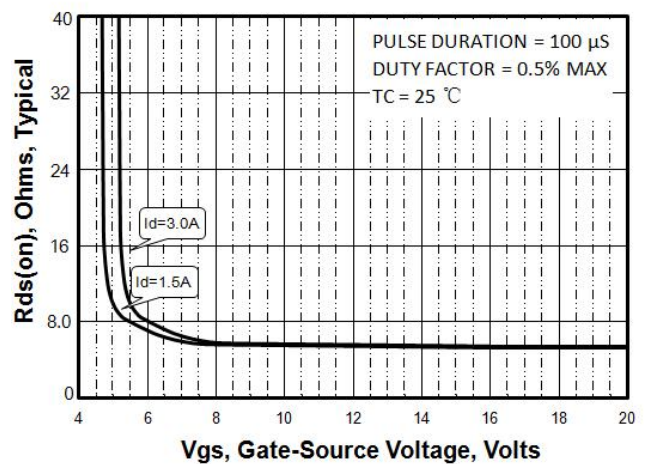


Figure 5. Rds(on) vs Gate Voltage



CHARACTERISTIC CURVES

Figure 6. Peak Current Capability

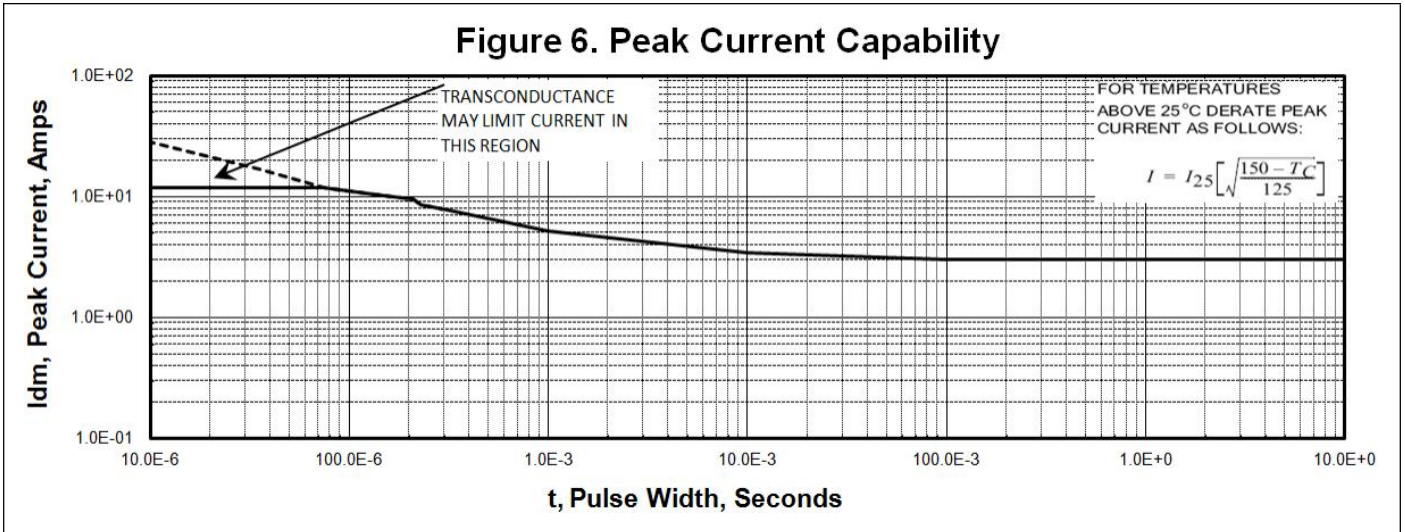


Figure 7. Transfer Characteristics

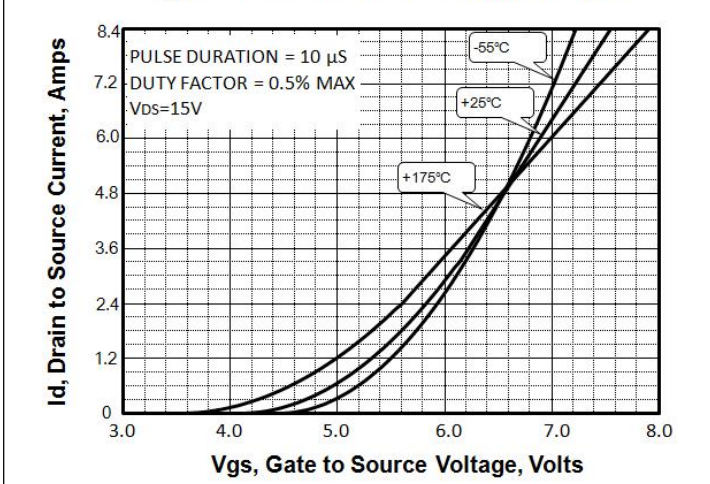


Figure 8. Unclamped Inductive Switching Capability

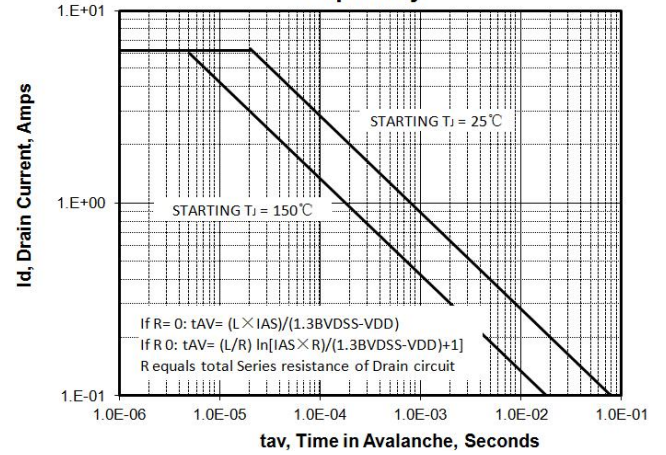


Figure 9. Drain to Source ON Resistance vs Drain Current

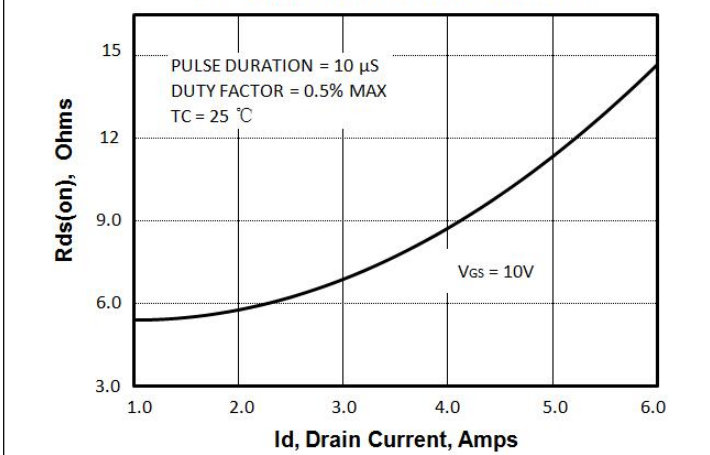


Figure 10. Rds(on) vs Junction Temperature

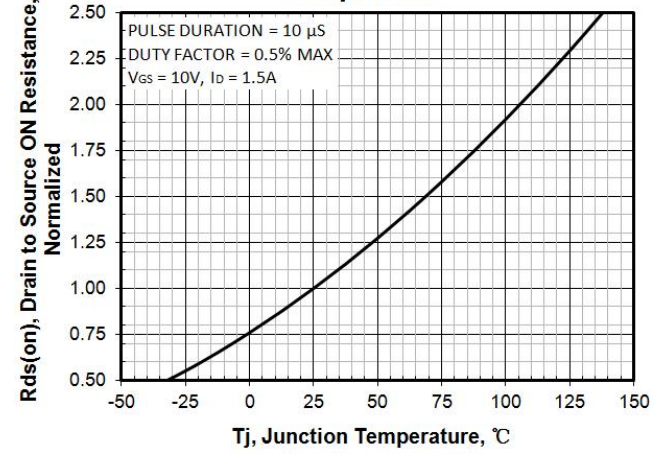


Figure 11. Breakdown Voltage vs Temperature

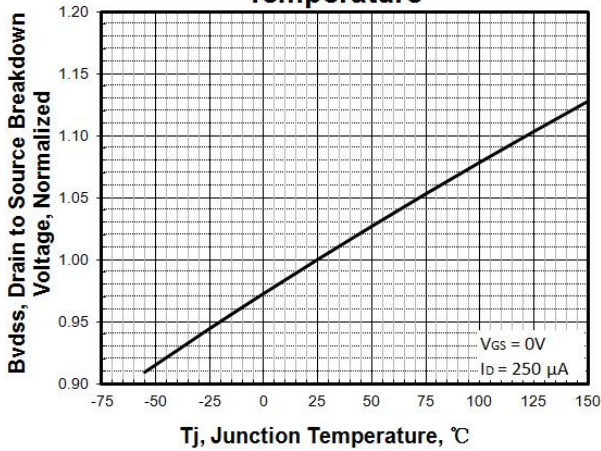


Figure 12. Threshold Voltage vs Temperature

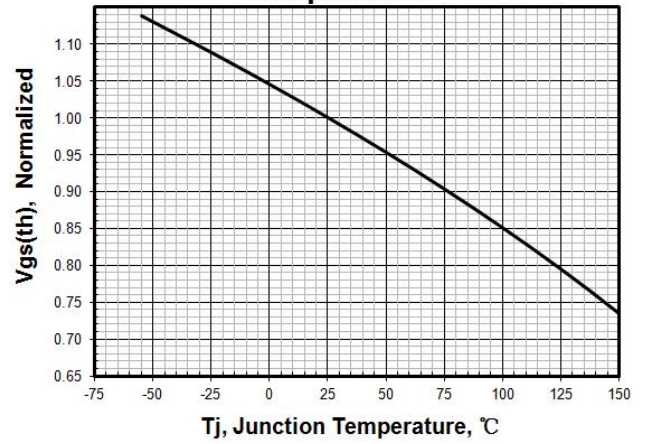


Figure 13 . Maximum Safe Operating Area

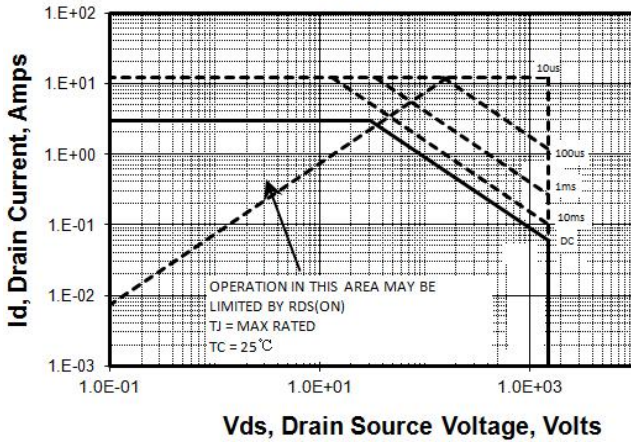


Figure 14. Body Diode Transfer Characteristics

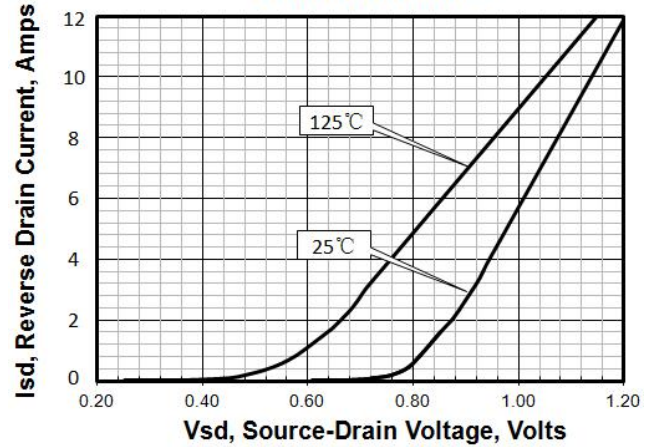


Figure 15. Capacitance vs Vds

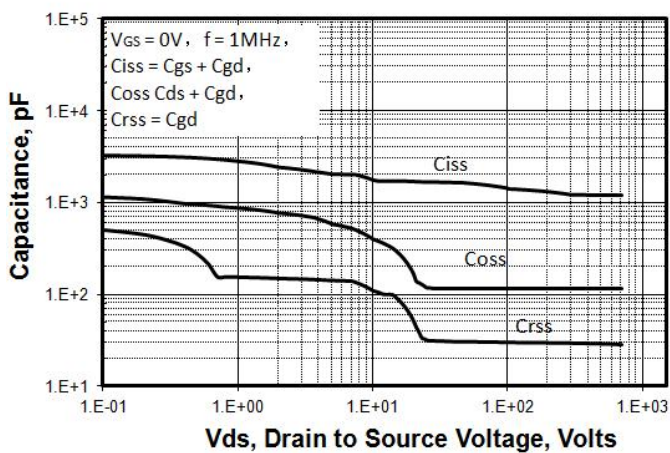
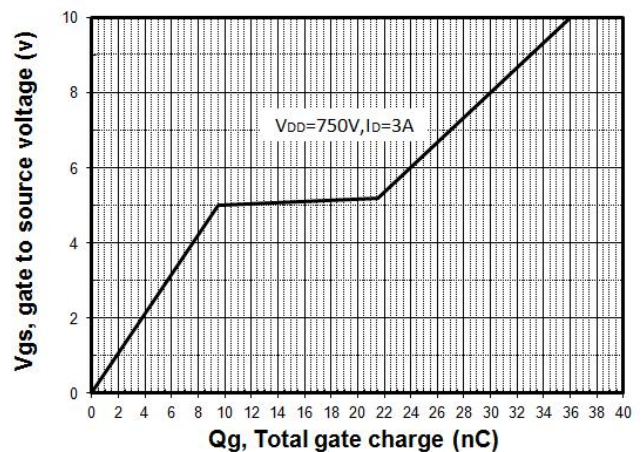


Figure 16 . Typical Gate Charge



TEST CIRCUITS

Fig. 1.1 Peak Diode Recovery dv/dt Test Circuit

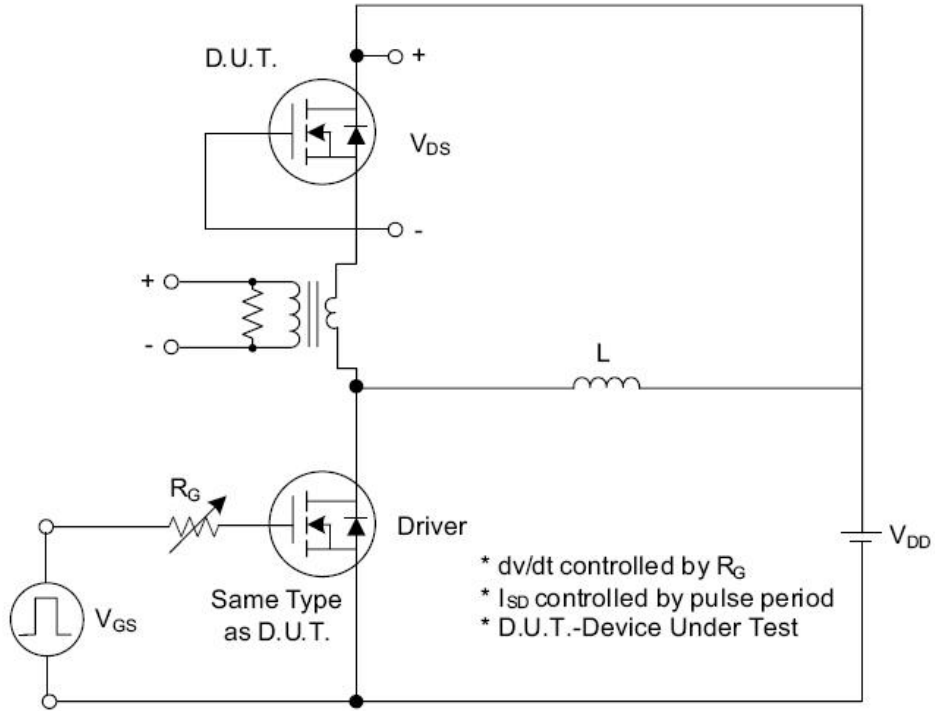


Fig. 1.2 Peak Diode Recovery dv/dt Waveforms

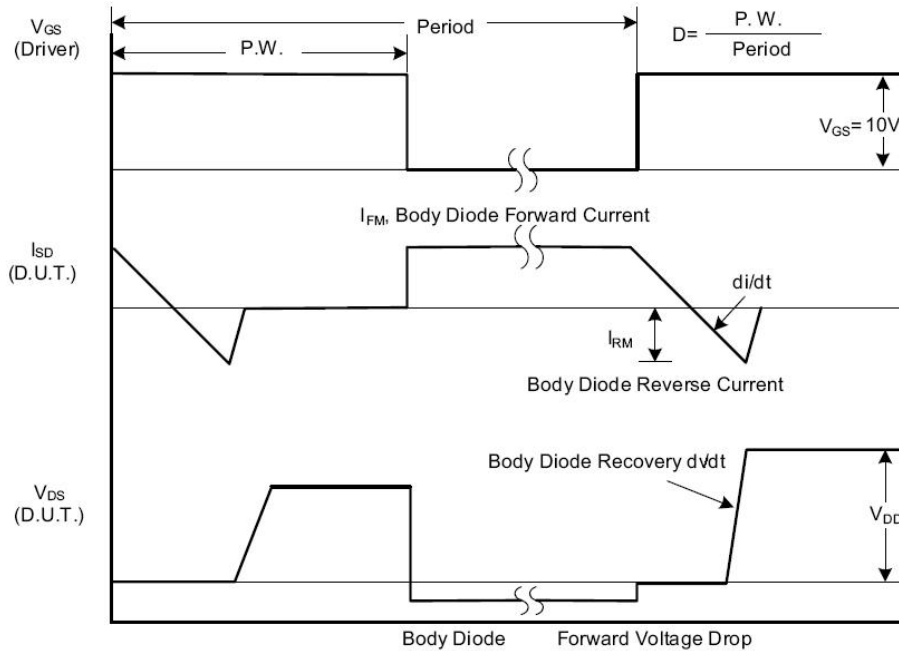


Fig. 2.1 Switching Test Circuit & Waveforms

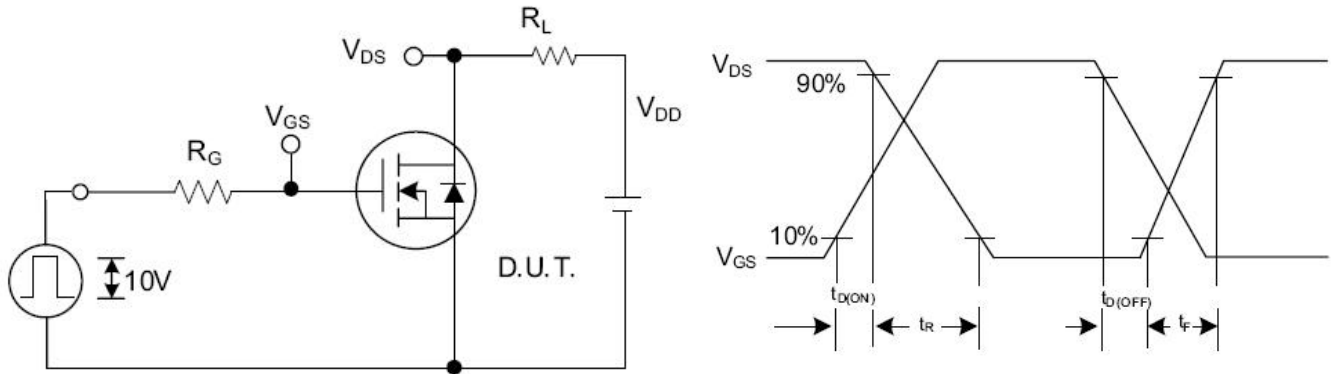


Fig. 3.1 Gate Charge Test Circuit & Waveforms

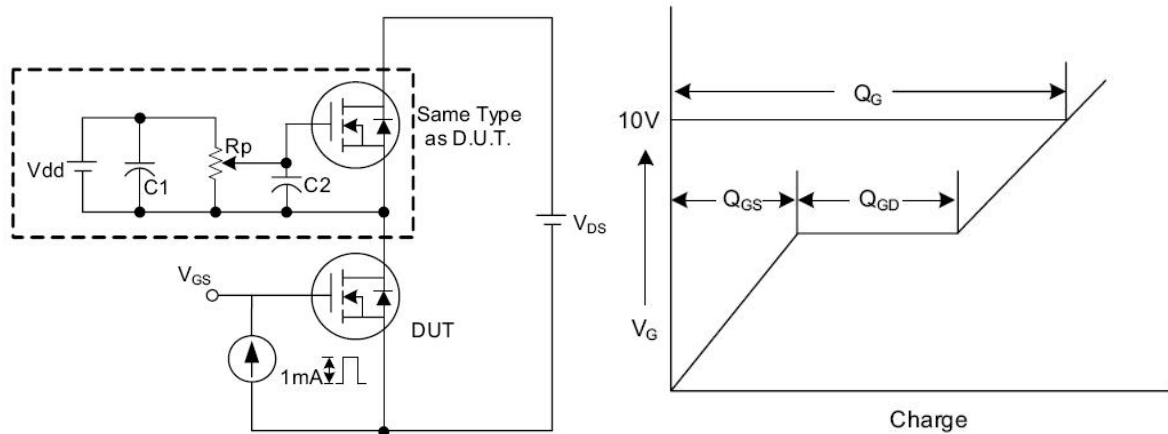
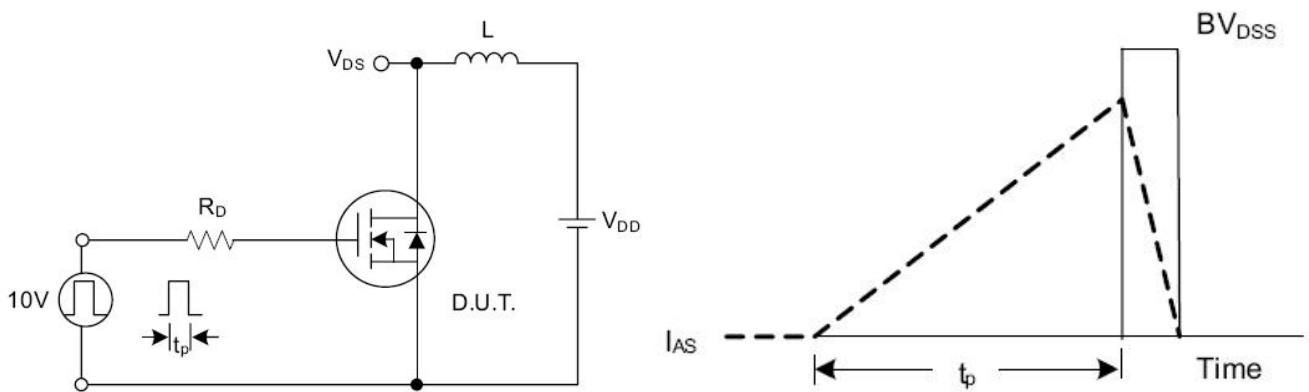
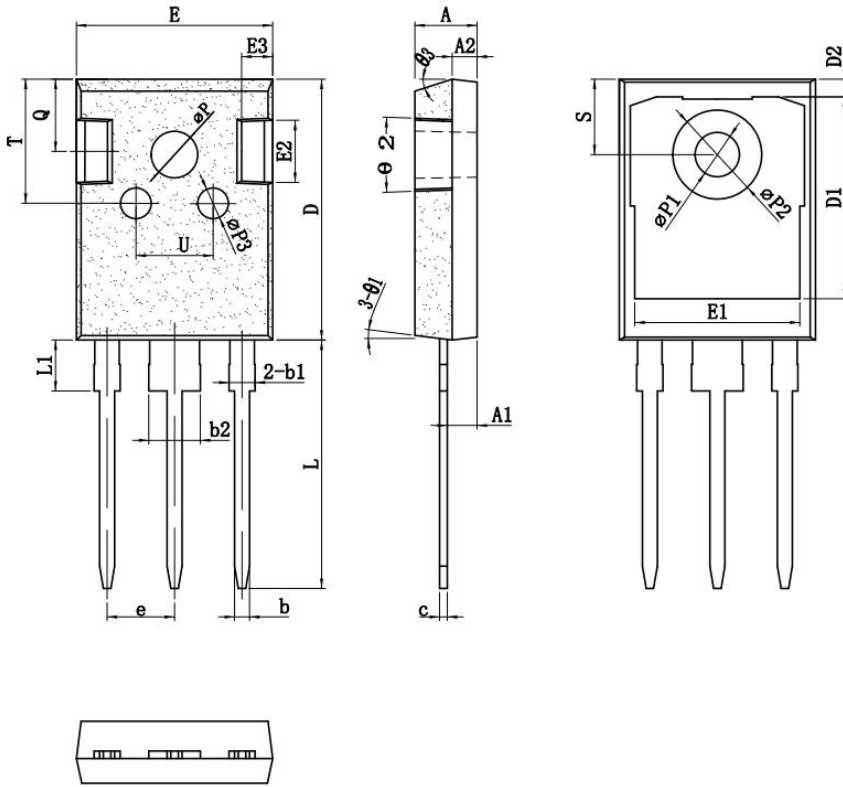


Fig. 4.1 Unclamped Inductive Switching Test Circuit & Waveforms



PACKAGE DIMENSIONS

Option TO-247

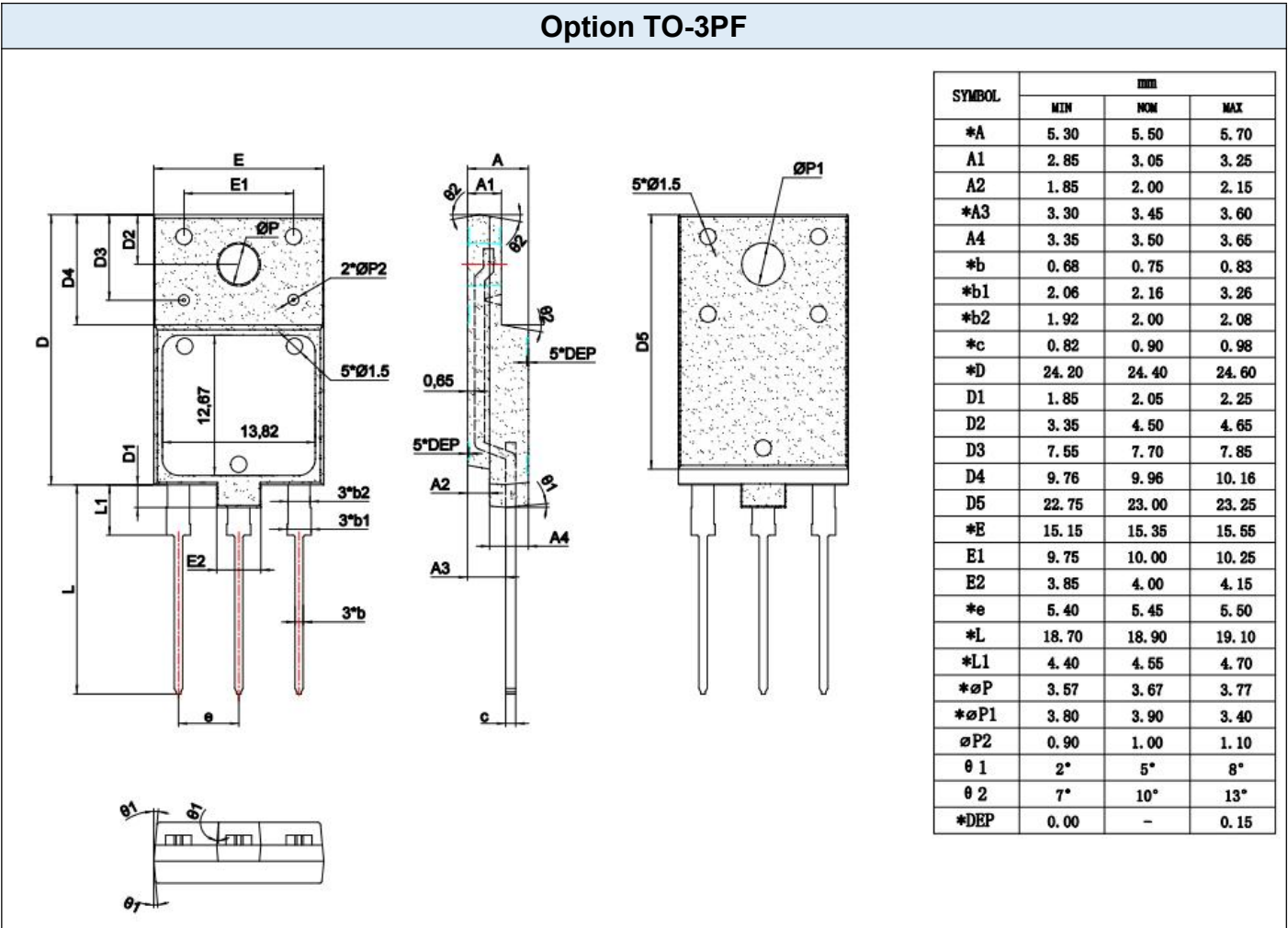


SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.98	20.15
*L1	-	-	4.30
*ΦP	3.60	3.70	3.80
*ΦP1	3.45	3.55	3.65
ΦP2	7.03	7.18	7.33
ΦP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
*S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°

- Dimensions in mm unless otherwise stated

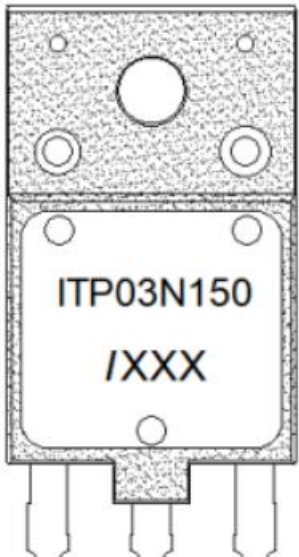
PACKAGE DIMENSIONS

Option TO-3PF



- Dimensions in mm unless otherwise stated

ORDERING AND MARKING INFORMATION

Marking Information	
	<p>ITP03N150 : Part Number I : ISOMICRON X : Fiscal Year X : Work Week</p>
Order Code	
<p>I T P(H) 03N 150</p>	
<p>Company Abbr ←</p> <p>T: Tj=150°C ←</p> <p>P: TO-3PF H: TO-247 ←</p>	<p>BV_{DSS}=1500v →</p> <p>ID=3A →</p>

DISCLAIMER

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- Please contact ISOMICRON sales agent for special application request.
- Immerge unit's body in solder paste is not recommended.
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- Discoloration might be occurred on the package surface after soldering, reflow or long-time use. It neither impacts the performance nor reliability.